

TYPICAL SET OUT DIMENSIONS & QUANTITY CALCULATIONS FOR SLAB LINK BOX CULVERTS (UP TO 1800mm CULVERT CELL HEIGHT) AND UP TO 35° SKEW

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**TABLE 1: CULVERT SKEW ANGLE 0° TO 20°**  
(WINGWALL ANGLES  $\alpha = 45^\circ$  &  $\beta = 45^\circ$ ) (BATTER SLOPE OF 1V:2H)

SETOUT DIMENSIONS					
D	H	A	B	E	C
450	1030	1660	1660	1660	W+3320
600	1180	1960	1960	1960	W+3920
750	1330	2260	2260	2260	W+4520
900	1480	2560	2560	2560	W+5120
1050	1680	2960	2960	2960	W+5920
1200	1830	3260	3260	3260	W+6520
1350	1980	3560	3560	3560	W+7120
1500	2130	3860	3860	3860	W+7720
1650	2280	4160	4160	4160	W+8320
1800	2430	4460	4460	4460	W+8920

**TABLE 4: CULVERT SKEW ANGLE 20° TO 30°**  
(WINGWALL ANGLES  $\alpha = 9.5^\circ$  &  $\beta = 51^\circ$ ) (BATTER SLOPE OF 1V:2H)

SETOUT DIMENSIONS					
D	H	A	B	E	C
450	1030	1660	280	2050	W+2330
600	1180	1960	330	2430	W+2760
750	1330	2260	380	2800	W+3180
900	1480	2560	430	3170	W+3600
1050	1680	2960	500	3660	W+4160
1200	1830	3260	550	4030	W+4580
1350	1980	3560	600	4400	W+5000
1500	2130	3860	650	4770	W+5420
1650	2280	4160	700	5140	W+5840
1800	2430	4460	750	5510	W+6260

**TABLE 7: CULVERT SKEW ANGLE 30° TO 35°**  
(WINGWALL ANGLES  $\alpha = 8.5^\circ$  &  $\beta = 54^\circ$ ) (BATTER SLOPE OF 1V:2H)

SETOUT DIMENSIONS					
D	H	A	B	E	C
450	1030	1660	250	2290	W+2540
600	1180	1960	300	2700	W+3000
750	1330	2260	340	3120	W+3460
900	1480	2560	390	3530	W+3920
1050	1680	2960	450	4080	W+4530
1200	1830	3260	490	4490	W+4980
1350	1980	3560	540	4900	W+5440
1500	2130	3860	580	5320	W+5900
1650	2280	4160	630	5730	W+6360
1800	2430	4460	670	6140	W+6810

**TABLE 2: CULVERT SKEW ANGLE 0° TO 20°**  
(WINGWALL ANGLES  $\alpha = 45^\circ$  &  $\beta = 45^\circ$ ) (BATTER SLOPE OF 1V:4H)

SETOUT DIMENSIONS					
D	H	A	B	E	C
450	1030	3320	3320	3320	W+6640
600	1180	3920	3920	3920	W+7840
750	1330	4520	4520	4520	W+9040
900	1480	5120	5120	5120	W+10240
1050	1680	5920	5920	5920	W+11840
1200	1830	6520	6520	6520	W+13040
1350	1980	7120	7120	7120	W+14240
1500	2130	7720	7720	7720	W+15440
1650	2280	8320	8320	8320	W+16640
1800	2430	8920	8920	8920	W+17840

**TABLE 5: CULVERT SKEW ANGLE 20° TO 30°**  
(WINGWALL ANGLES  $\alpha = 9.5^\circ$  &  $\beta = 51^\circ$ ) (BATTER SLOPE OF 1V:4H)

SETOUT DIMENSIONS					
D	H	A	B	E	C
450	1030	3320	560	4100	W+4660
600	1180	3920	660	4850	W+5510
750	1330	4520	760	5590	W+6350
900	1480	5120	860	6330	W+7190
1050	1680	5920	1000	7320	W+8320
1200	1830	6520	1100	8060	W+9160
1350	1980	7120	1200	8800	W+10000
1500	2130	7720	1300	9540	W+10840
1650	2280	8320	1400	10280	W+11680
1800	2430	8920	1500	11020	W+12520

**TABLE 8: CULVERT SKEW ANGLE 30° TO 35°**  
(WINGWALL ANGLES  $\alpha = 8.5^\circ$  &  $\beta = 54^\circ$ ) (BATTER SLOPE OF 1V:4H)

SETOUT DIMENSIONS					
D	H	A	B	E	C
450	1030	3320	500	4570	W+5070
600	1180	3920	590	5400	W+5990
750	1330	4520	680	6230	W+6910
900	1480	5120	770	7050	W+7820
1050	1680	5920	890	8150	W+9040
1200	1830	6520	980	8980	W+9960
1350	1980	7120	1070	9800	W+10870
1500	2130	7720	1160	10630	W+11790
1650	2280	8320	1250	11460	W+12710
1800	2430	8920	1340	12280	W+13620

**TABLE 3: CULVERT SKEW ANGLE 0° TO 20°**  
(WINGWALL ANGLES  $\alpha = 45^\circ$  &  $\beta = 45^\circ$ ) (BATTER SLOPE OF 1V:6H)

SETOUT DIMENSIONS					
D	H	A	B	E	C
450	1030	4980	4980	4980	W+9960
600	1180	5880	5880	5880	W+11760
750	1330	6780	6780	6780	W+13560
900	1480	7680	7680	7680	W+15360
1050	1680	8880	8880	8880	W+17760
1200	1830	9780	9780	9780	W+19560
1350	1980	10680	10680	10680	W+21360
1500	2130	11580	11580	11580	W+23160
1650	2280	12480	12480	12480	W+24960
1800	2430	13380	13380	13380	W+26760

**TABLE 6: CULVERT SKEW ANGLE 20° TO 30°**  
(WINGWALL ANGLES  $\alpha = 9.5^\circ$  &  $\beta = 51^\circ$ ) (BATTER SLOPE OF 1V:6H)

SETOUT DIMENSIONS					
D	H	A	B	E	C
450	1030	4980	840	6150	W+6990
600	1180	5880	990	7270	W+8260
750	1330	6780	1140	8380	W+9520
900	1480	7680	1290	9490	W+10780
1050	1680	8880	1490	10970	W+12460
1200	1830	9780	1640	12080	W+13720
1350	1980	10680	1790	13190	W+14980
1500	2130	11580	1940	14310	W+16250
1650	2280	12480	2090	15420	W+17510
1800	2430	13380	2240	16530	W+18770

**TABLE 9: CULVERT SKEW ANGLE 30° TO 35°**  
(WINGWALL ANGLES  $\alpha = 8.5^\circ$  &  $\beta = 54^\circ$ ) (BATTER SLOPE OF 1V:6H)

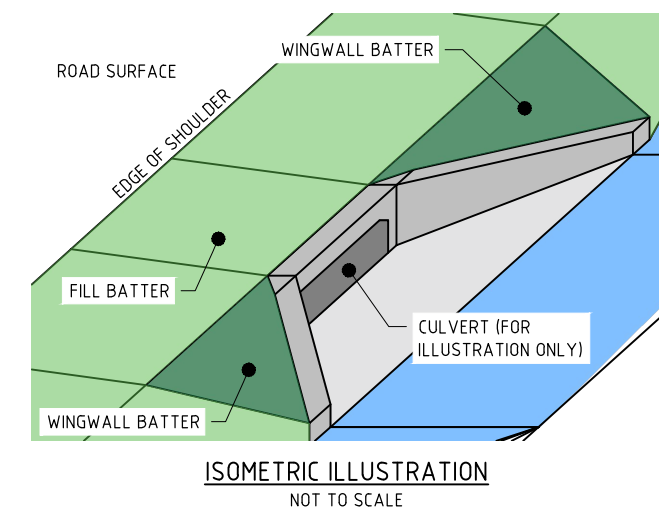
SETOUT DIMENSIONS					
D	H	A	B	E	C
450	1030	4980	750	6860	W+7610
600	1180	5880	880	8100	W+8980
750	1330	6780	1020	9340	W+10360
900	1480	7680	1150	10580	W+11730
1050	1680	8880	1330	12230	W+13560
1200	1830	9780	1470	13470	W+14940
1350	1980	10680	1600	14700	W+16300
1500	2130	11580	1740	15940	W+17680
1650	2280	12480	1870	17180	W+19050
1800	2430	13380	2000	18420	W+20420

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED ELSEWHERE
- STANDARD DRAWING REFERENCES:
  - CS3107 - RCBC SETOUT DETAILS
  - CS3108 - RCBC CROWN UNIT & LINK SLAB INSTALLATION DETAIL
  - CS3109 - RCBC WINGWALL AND HEADWALL DETAIL FOR D < 900mm
  - CS3110 - RCBC WINGWALL AND HEADWALL DETAIL FOR D > 900mm
  - CS3111 - RCBC CONSTRUCTION OF BASES WITH NIBS & APRONS
  - CS3112 - RCBC CONSTRUCTION OF BASES WITH RECESSES & APRONS
- TO ASSIST PROJECT DEVELOPMENT, TENDERING AND CONSTRUCTION, FORMULAS ARE PROVIDED TO DEVELOP QUANTITIES FOR SLBC BOX CULVERTS. IT IS THE RESPONSIBILITY OF THE DESIGNER / CONSULTANT / CONTRACTOR TO VERIFY THE BELOW FORMULAS, AND WHERE A DISCREPANCY EXISTS, INFORM THE DEPARTMENT AS SOON AS PRACTICAL. THE TABLES & FORMULAS PROVIDED REFERENCE THE BELOW STANDARD DRAWINGS:
  - CS3107 - REFERENCE FOR [H], [A], [B], [E], [T], [α], [β] AND HEADWALL DEPTH
  - CS3111 & CS3112 - VALUES FOR [Bt]
  - CS3131 - VALUES FOR [α] & [β]

QUANTITY CALCULATIONS FOR SLBC CULVERTS	
CULVERT COMPONENT	FORMULA
HEADWALL	$Q_{HEADWALL} = [T] \times HEADWALL\ DEPTH \times [W]$
WINGWALL 1 LENGTH - $A_{W1}$	$A_{W1} = [A] / \cos(\alpha)$
WINGWALL LENGTH 2 - $A_{W2}$	$A_{W2} = [A] / \cos(\beta)$
WINGWALL - Q DUE TO $A_{W1}$	$Q_{AW1} = ([A_{W1}] \times 200mm \times [T]) + (([A_{W1}] \times (H - 200mm)) \times 0.5 \times [T])$
WINGWALL - Q DUE TO $A_{W2}$	$Q_{AW2} = ([A_{W2}] \times 200mm \times [T]) + (([A_{W2}] \times (H - 200mm)) \times 0.5 \times [T])$
APRON	$Q_{APRON} = (([A] \times [W]) + (0.5 \times [B] \times [A]) + (0.5 \times [E] \times [A]))$
CUT OFF WALL - INLET	$Q_{CUT-IN} = (([W] + [B] + [E]) \times 200mm \times 150mm)$
CUT OFF WALL - OUTLET	$Q_{CUT-OUT} = (([W] + [B] + [E]) \times 450mm \times 150mm)$
FOOTING DUE TO $A_{W1}$	$Q_{F1} = ([A_{W1}] \times 300mm \times 100mm) + ((0.75[H] - 300mm) \times [A_{W1}] \times 0.5) \times 0.1$
FOOTING DUE TO $A_{W2}$	$Q_{F2} = ([A_{W2}] \times 300mm \times 100mm) + ((0.75[H] - 300mm) \times [A_{W2}] \times 0.5) \times 0.1$
IN-SITU BASE SLAB	$Q_{BASE} = [Bt] \times [W] \times LENGTH\ OF\ CULVERT\ FROM\ INVERT\ TO\ INVERT$
TOTAL PER CULVERT	$Q_T = 2 \times (Q_{HEADWALL} + Q_{AW1} + Q_{AW2} + Q_{APRON} + Q_{F1} + Q_{F2}) + Q_{CUT-IN} + Q_{CUT-OUT} + Q_{BASE}$

NOTES:  
1. QUANTITY CALCULATIONS ARE PROVIDED AND INCLUDE THE FOLLOWING: HEADWALL, WINGWALLS, APRON, CUT OFF WALL & FOOTINGS



Drawn <b>J. COOK</b> Date: MAR 2023	Checked <b>S. HATZI</b> Date: APR 2023
Designed <b>J. COOK</b> Date: MAR 2023	Checked <b>S. HATZI</b> Date: APR 2023
Design Project Leader <b>DIPL</b> Date: APR 2023	NTG Project Manager <b>DIPL</b> Date: APR 2023



<b>STANDARD DRAWINGS</b> DRAINAGE			
SLBC - 450mm - 1800mm HEIGHT & 1V:2H TO 1V:6H BATTER SETOUT DIMENSIONS & QUANTITIES - 0° TO 35° SKEW			
NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.
-	-	5 OF 6	CS3131
			Amendment <b>0 A1</b>

0	ISSUED AS A STANDARD DRAWING	APR 2023	J. COOK	TCS / DIPL
No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT./COMPANY